AMENDMENTS TO THE CLAIMS

1.   (Currently amended) An apparatus comprising:

a main memory for storing data;

one or more I/O devices for receiving data from or sending data to said main memory;

a control unit for controlling said I/O devices;

at least one an I/O processor (IOP) for controlling I/O operations for sending data between said main memory and said I/O devices;

a plurality of disparate channels between said IOP and said control unit, said disparate channels including multiple channel paths for carrying data between said main memory and said I/O devices during said I/O operations, said disparate channels including more than one type of channel at least one enterprise system connection (ESCON) channel, at least one Ficon Bridge (FCV) channel, and at least one Ficon Native channel (FC), each channel keeping a copy of channel busy data (CBD), said IOP keeping a copy of the CBD for each channel, said ESCON channel keeping a busy vector and a one deep queue full vector, said FC channel keeping DMA thresholds, number of exchanges, and queue totals; and

a computer program executed by said IOP for selecting assigning a path weight to selected ones of said channel paths as whereby the next channel path to carry data between said main memory and said I/O devices is selected, said computer program determining a path weight, said path weight being assigned to a path by building a path weight table, said path weight being adjusted to enable comparison between different types of channels, said path weight being based on said busy vector and said one deep queue full vector for said ESCON channel, said path weight being based on said DMA thresholds, said number of exchanges, and said queue totals for said FC channel;

wherein each said channel has an affinity to one of said IOP. said computer program includes an algorithm for assigning a path weight to a channel path candidate dependent upon the type of channel containing the channel path candidate.

2.   (Cancelled)

3.   (Cancelled)

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4.   (Cancelled)

5.   (Cancelled)

6.   (Cancelled)

7.   (Currently amended) The apparatus of claim 6̶1 wherein said computer program classes
a channel path candidate as a great candidate, a bad candidate, or an OK candidate dependent
on the value of the given channel path's path weight value, said computer program further
including an algorithm for selecting the channel path candidate to initiate the I/O operation
--on if it is classed as a great candidate, evaluating time next candidate if it is classed as an OK
channel path or a bad channel path, or selecting the OK candidate with the least path weight
to initiate the I/O operation on if there are no great candidates found while rejecting any bad
candidates.

8.   (Original) The apparatus of claim 7 further comprising multiple IOPs, each channel
path having an affinity to one IOP, a work queue having work elements for each IOP, and
said computer program comprises a loop for determining the best class of available
candidates, and from that class picking the candidate that has affinity to the IOP with the
least number of work elements on its work queue.

9.   (Currently Amended) A data processing system having a main memory for storing
data, one or more I/O devices for receiving data from or sending data to said main memory,
and an I/O processor (IOP) for controlling I/O operations for sending data between said main
memory and said I/O devices, an apparatus for selecting paths between the main memory and
the I/O devices comprising:
        at least one disparate channels between the IOP and the I/O devices, said disparate
channels including multiple channel paths for carrying data between the main memory and
the I/O devices during the I/O operations, said disparate channels including more than one
type of channel; and

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a plurality of disparate-channels between said IOP and said control unit, said disparate channels including multiple channel paths for carrying data between said main memory and said I/O devices during said I/O operations, said disparate-channels including more than one type of channel at least one enterprise system connection (ESCON) channel, at least one Ficon Bridge (FCV) channel, and at least one Ficon Native channel (FC), each channel keeping a copy of channel busy data (CBD), said IOP keeping a copy of the CBD for each channel, said ESCON channel keeping a busy vector and a one deep queue full vector. said FC channel keeping DMA thresholds, number of exchanges, and queue totals; and

a computer program executed by said IOP for selecting assigning a path weight to selected ones of said channel paths as whereby the next channel path to carry data between said main memory and said I/O devices is selected, said computer program determining a path weight, said path weight being assigned to a path by building a path weight table, said path weight being adjusted to enable comparison between different types of channels, said path weight being based on said busy vector and said one deep queue full vector for said ESCON channel, said path weight being based on said DMA thresholds, said number of exchanges, and said queue totals for said FC channel;

wherein each said channel has an affinity to one of said IOP. said computer program includes an algorithm for assigning a path weight to a channel path candidate dependent upon the type of channel containing the channel path candidate.

10.   (Cancelled)

11.   (Cancelled)

12.   (Cancelled)

13.   (Cancelled)

14.   (Cancelled)

15.   (Currently Amended) The apparatus of claim 14 9 wherein said computer program

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classes a channel path candidate as a great candidate, a bad candidate, or an OK candidate dependent on the value of the given channel path's path weight value, said computer program further including an algorithm for selecting the channel path candidate to initiate the I/O operation on if it is classed as a great candidate, evaluating the next candidate if it is classed as an OK channel path or a bad channel path, or selecting the OK candidate with the least path weight to initiate the I/O operation on if there are no great candidates found while rejecting any bad candidates.

16.   (Original) The apparatus of claim 15 further comprising multiple IOPS, ~~each channel path having an affinity to one IOP,~~ a work queue having work elements for each IOP, and said computer program comprises a loop for determining the best class of available candidates, and from that class picking the candidate that has affinity to the IOP with the least number of work elements on its work queue.

17.   (Currently Amended) A method for selecting channel paths in a data processing system having a main memory for storing data, one or more I/O devices for receiving data from or sending data to said main memory, an I/O processor (IOP) for controlling I/O operations for sending data between said main memory and said I/O devices, and disparate channels between the IOP and the I/O devices, said disparate channels including multiple channel paths for carrying data between the main memory and the I/O devices during the I/O operations, said disparate channels including ~~more than one type of channel~~ at least one enterprise system connection (ESCON) channel, at least one Ficon Bridge (FCV) channel, and at least one Ficon Native channel (FC), each channel keeping a copy of channel busy data (CBD), said IOP keeping a copy of the CBD for each channel, said ESCON channel keeping a busy vector and a one deep queue full vector, said FC channel keeping DMA thresholds, number of exchanges, and queue totals, said method comprising:

assigning a path weight to selected ones of said channel paths; ~~and~~ said path weight being assigned to a path by building a path weight table, said path weight being adjusted to enable comparison between different types of channels, said path weight being based on said busy vector and said one deep queue full vector for said ESCON channel, said path weight being based on said DMA thresholds, said number of exchanges, and said queue totals for

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said FC channel; and

selecting the next channel path to carry data between said main memory and said I/O devices based on said path weight; ~~and~~

~~assigning a path weight to a channel path candidate dependent upon the type of channel containing the channel path candidate.~~

wherein each said channel has an affinity to one of said IOP.

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Currently Amended) The method of claim ~~22~~ 17 further comprising:

classifying a channel path candidate as a great candidate, a bad candidate, or an OK candidate dependent on the value of the given channel path's path weight value; and

selecting the channel path candidate to initiate the I/O operation on if it is classed as a great candidate, evaluating the next candidate if it is classed as an OK channel path or a bad channel path, or selecting the OK candidate with the least path weight to initiate the I/O operation on if there are no great candidates found while rejecting any bad candidates.

24. (Original) The method of claim 23 wherein said data processing system includes multiple IOPs, ~~each channel path having an affinity to one IOP,~~ a work queue having work elements for each IOP, and said method further comprises:

performing a loop for determining the best class of available candidates; and

from that class, picking the candidate that has affinity to the IOP with the least number of work elements on its work queue.

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25.   (Currently Amended) A program product usable with in a data processing system
having a main memory for storing data, one or more I/O devices for receiving data from or
sending data to said main memory, an I/O processor (IOP) for controlling I/O operations for
sending data between said main memory and said I/O devices, and disparate channels
between the IOP and the I/O devices, said disparate channels including multiple channel
paths for carrying data between the main memory and the I/O devices during the I/O
operations, said disparate channels including more than one type of channel at least one
enterprise system connection (ESCON) channel, at least one Ficon Bridge (FCV) channel,
and at least one Ficon Native channel (FC), each channel keeping a copy of channel busy
data (CBD), said IOP keeping a copy of the CBD for each channel, said ESCON channel
keeping a busy vector and a one deep queue full vector, said FC channel keeping DMA
thresholds, number of exchanges, and queue totals, said program product comprising:

A computer readable medium having recorded thereon computer readable program
code means for performing the method comprising:

assigning a path weight to selected ones of said channel paths, and said path weight
being assigned to a path by building a path weight table, said path weight being adjusted to
enable comparison between different types of channels, said path weight being based on said
busy vector and said one deep queue full vector for said ESCON channel, said path weight
being based on said DMA thresholds, said number of exchanges, and said queue totals for
said FC channel; and

selecting the next channel path to carry data between said main memory and said I/O
devices based on said path weight; and

assigning a path weight to a channel path candidate dependent upon the type of
channel containing the channel path candidate.

wherein each said channel has an affinity to one of said IOP.

26.   (Cancelled)

27.   (Cancelled)

28.   (Cancelled)

29.   (Cancelled)

30.   (Cancelled)

31.   (Original) The program product of claim 30 wherein said method further comprises:

       classifying a channel path candidate as a great candidate, a bad candidate, or an OK candidate dependent on the value of the given channel path's path weight value; and

       selecting the channel path candidate to initiate the I/O operation on if it is classed as a great candidate, evaluating the next candidate if it is classed as an OK channel path or a bad channel path, or selecting the OK candidate with the least path weight to initiate the I/O operation on if there are no great candidates found while rejecting any bad candidates.

32.   (Original) The program product of claim 31 wherein said data processing system includes multiple IOPs, ~~each channel path having an affinity to one IOP,~~ a work queue having work elements for each IOP, and said method further comprises:

       performing a loop for determining the best class of available candidates; and from that class, picking the candidate that has affinity to the IOP with the least number of work elements on its work queue.